



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,916	08/27/2003	Takamasa Ishii	1232-5125	5081
27123	7590	03/30/2006	EXAMINER	
MORGAN & FINNEGAN, L.L.P. 3 WORLD FINANCIAL CENTER NEW YORK, NY 10281-2101			GAGLIARDI, ALBERT J	
			ART UNIT	PAPER NUMBER
			2884	

DATE MAILED: 03/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/648,916

Applicant(s)

ISHII ET AL.

Examiner

Albert J. Gagliardi

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 3,5,16,17,20 and 24-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6-15,18,19,21-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-27 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/06.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I (claims 1-24) in the reply filed on 27 December 2005 is acknowledged. The traversal is on the ground(s) that the examiner has not established a serious burden if restriction is not required. This is not found persuasive because MPEP 808.02 (A) shows that one manner of establishing a burden is by a showing of separate classification. In this case, as even noted by the applicant, the examiner has shown a separate classification for each of the three groups.

2. Applicant's election with traverse of Species A (as embodied in Figs. 1-3 and identified as claims 1, 2, 4, 6-15, 18, 19, and 21-23 (claims 25-27 belonging to a different group and claim 24 belonging to a different species – see below)) in the reply filed on 28 February 2006 (and incorporating the by reference information in the Remarks filed 27 December 2005) is acknowledged. The traversal is on the ground(s) that the examiner has not established a separate field of search for each of the species. This is not found persuasive because according to the MPEP, a requirement for restriction among species is proper when the species are mutually exclusive (MPEP 806.04(f)) and where there is a patentable difference between the species (MPEP 808.01 (a)). In the present case, the different embodiments as identified in the specification and the drawings clearly have mutually exclusive features; and therefore inherently require a different field of search because a different search query is necessarily required for the mutually exclusive elements (see MPEP 808.02(C)). Regarding the patentable distinctness, it is axiomatic that a conclusion by the examiner that the species are patentably distinct is necessarily made prior to actual examination and that, regardless of any restriction, applicant will be allowed

a reasonable number of species if a generic claim is found allowable (see MPEP 806.04). Since no generic claims have been found allowable, and applicant has not offered any evidence tending to show that the inventions are not patentably distinct, patentable distinctness is still presumed.

3. Regarding applicant's election of Species A as including claim 24, the examiner notes that selenium or gallium arsenide layers are not shown as belong to the embodiment of Species A (an embodiment utilizing a phosphor layer) but first occur in Species C (Fig. 7).

4. The requirement is still deemed proper and is therefore made FINAL.

5. Claims 3, 5, 16-17, 20 and 24-27 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species and/or invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 28 February 2006.

Drawings

6. The drawings were received on 27 December 2005. These drawings are acceptable.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1, 2, 4, 6-15, 18, 19 and 21-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding independent claim 1, the claim recites the limitation "the same layer" in the last line of the claim. There is insufficient antecedent basis for this limitation in the claim. The examiner notes that there is no antecedent basis for any layer having been formed on the

Art Unit: 2884

substrate. The examiner notes that prior to amendment, the claim required that the semiconductor layers of the conversion elements be formed from the same layer, but as amended, the claims seem to require the existence of some previously undisclosed layer be formed on the substrate, with the nature of any such layer being unclear.

Regarding claim 2, the claim recites "a semiconductor layer" thinner than "said semiconductor layer." There is insufficient antecedent basis for this limitation in the claim. The examiner notes that there is no antecedent basis for a semiconductor layer (other than the one in claim 2), and that it further unclear how a layer may be thinner than itself.

Regarding claim 11, the claim recites "the first electrode" and "the second electrode." There is insufficient antecedent basis for these limitations in the claim. The examiner notes that there is an antecedent basis for a first electrode in claim 8, but such claim is not in the chain of dependency, and that there is no antecedent basis for any second electrode.

Regarding claim 14, the claim recites "the second electrode." There is insufficient antecedent basis for these limitations in the claim. The examiner notes that there is no antecedent basis for any second electrode in antecedent claim 8 as amended.

9. Regarding independent claim 23, the claim is considered indefinite for the same reasons.

10. The remaining claims are at least rejected on the basis of their dependency.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 1, 2, 6, 8-11, 18-19, 21-22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garland *et al.* (US 6,198,800) in view of Kaifu *et al.* (US 6,075,256).

Regarding claim 1, as best understood, *Garland* discloses (Figs. 1-4) a radiation sensing apparatus for sensing a radiation by a sensing unit and outputting an electric signal corresponding to the sensed radiation, wherein said sensing unit comprises: a substrate (inherent or obvious design choice; a conversion section (209ip) arranged on said substrate and configured to have a first semiconductor conversion element (301, for example) for converting the radiation into an electrical signal and a switch element (302, for example) connected to the first semiconductor conversion element, for switching the electrical signal; and a second semiconductor conversion element (209ep) arranged on said substrate, configured to convert the radiation into an electrical signal for detecting a dose of the radiation incident on said conversion section (col. 2, lines 31-33); wherein the first semiconductor conversion element and the second semiconductor conversion element are formed in a similar manner (col. 5, lines 17-23).

Regarding the elements being formed on the same layer on the substrate, although not specifically disclosed by *Garland*, it is well known and typical in the art to form each pixel of an

array on the same layer. *Kaifu*, for example, teaches that it is advantageous to form the elements to have the same layer structure so that they may be formed in an identical process at the same time to allow for lower cost and higher yield (col. 9, lines 1-13; and col. 37, lines 41-53). Therefore, it would have been an obvious design choice, if not inherent, to form the first and second conversion elements on the same layer so as to allow for lower costs and higher yield.

Regarding claim 2, as best understood, *Garland* suggests (Fig. 3) that the switch element semiconductor layer is thinner than the convertor semiconductor layer. In addition, it is noted that absent some degree of criticality, the particular optimal thicknesses of the layers are considered well-known result effective variables depending on a variety of factors such as the desired area, thickness, and volume of the conversion element, the design resistances and the capacitances of the elements, the arrangement of the elements, as well as other factors such as the type (i.e., wavelength) of radiation to be detected.

Regarding claim 6, *Garland* further discloses a wavelength conversion member (102.2).

Regarding claim 8, *Garland* further discloses a bias line (401) connected to an electrode of the conversion element.

Regarding claim 9, *Garland* discloses that the switch element is a TFT (302).

Regarding claim 10, *Garland* discloses that the second conversion element is a total dose pixel (col. 2, lines 31-37).

Regarding claim 11, as best understood, *Garland* discloses that the first conversion element and the TFT are arranged in a matrix (see generally Fig. 4) with the first and second electrodes connected to one of a plurality of bias lines (401) arranged in parallel.

Regarding claims 18, 19, and 21-22, as best understood, although not specifically disclosed by *Garland* transparent electrodes and ohmic contacts are well known in the art (see for example *Kaifu* at col. 11, lines 44-60) and would have been an obvious design choice in order to improve sensor performance.

Regarding claim 23, the apparatus recited according to claim 23 is suggested by the apparatus of claim 1 and is rejected accordingly. In regards to the capacitive element, *Garland* discloses that the first conversion element includes a capacitance across the layers and a switch element connected to the capacitive element (col. 4, line 59 to col. 5, line 16).

14. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Garland* and *Kaifu* as applied above, and further in view of Okumura *et al.* (2002/0054659 A1).

Regarding claim 7, although *Garland* does not disclose that the conversion elements are stacked, *Okumura* discloses a radiation detection system wherein the conversion elements and the switch elements are stacked (see generally figs. 23A and 23B). Those skilled in the art appreciate that while forming the elements in the same layer allows for simpler fabrication with fewer steps, a stacked arrangement allows for a higher fill-factor (larger photo-sensitive area).

Allowable Subject Matter

15. Claims 4, 12-13 and 14-15 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Regarding dependent claims 4 and 14-15, although *Garland* in view of *Kaifu* suggest first and second conversion elements, they do not disclose or fairly suggest that the second element has the structure of a FET.

Art Unit: 2884

Regarding dependent claims 12-13, although *Garland* in view of *Kaifu* suggest first and second conversion elements, they do not disclose or fairly suggest that a first pixel includes both the first and second conversion elements.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert J. Gagliardi whose telephone number is (571) 272-2436. The examiner can normally be reached on Monday thru Friday from 10 AM to 6 PM.

Art Unit: 2884

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

19. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Albert J. Gagliardi
Primary Examiner
Art Unit 2884

AJG